

Two-Pass Herbicide Programs for Weed Control in Soybean

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Introduction

The purpose of this study was to evaluate weed control and crop injury for various soybean herbicide programs utilizing both preemergence and postemergence applications.

Materials and Methods

The study was established using a randomized complete block design with three replications. Herbicides were applied in 15 gallons of water/acre. The crop rotation was soybean following corn. The pre-plant seedbed was prepared with two passes using a field cultivator. Soybean was planted at 160,000 seeds/acre in 30-in. rows May 23.

Preemergence (PRE) treatments were applied May 23. Postemergence (POST) treatments were applied June 13 to soybean at the V3 growth stage. Weeds were generally 5–7 in. tall. Weed species in the study included woolly cupgrass (*Erbvi*), velvetleaf (*Abuth*), and ivyleaf morningglory (*Ipohe*) with average populations of 25, 3, and 0.5 plants/ft², respectively. Visual estimates of soybean injury and percentage weed control were made during the growing season. These observations are compared with an untreated control and made on a zero to 99 rating scale (0 percent = no control or injury; 99 percent = complete control or crop kill).

Results and Discussion

Summarized in Tables 1 and 2 are the results of the study. None of the PRE treatments exhibited more than 15 percent soybean injury when observed at the POST application timing June 13 (Table 1). PRE Fierce MTZ caused 8 percent injury, and Panther PRO and Surveil caused 12 and 15 percent injury, respectively. No other PRE treatments caused more than 5 percent injury. Soybean injury from POST treatments was most visible eight days after application on June 21 (Table 2). POST Flexstar GT 3.5 treatments caused 30–35 percent injury and Cobra treatments caused 40 percent injury. POST Abundit Edge + EverPrex caused 35 and 15 percent soybean injury when following PRE Surveil and Enlite, respectively. POST Anthem Maxx and Warrant Ultra treatments caused 20 percent injury, and Storm caused 25 percent injury. Injury levels caused by these POST treatments were still significant one week later (data not shown).

PRE Zidua + Sharpen, Broadaxe XC, Boundary, Tripzin ZC, and Fierce MTZ afforded 87 to 95 percent woolly cupgrass control (Table 1). Zidua PRO, Surveil, and Panther PRO each provided 80 percent control. Enlite, Authority First, and Rowel FX did not provide more than 45 percent control of woolly cupgrass.

PRE Zidua PRO, Zidua SC + Sharpen, Surveil, Panther PRO, and Fierce MTZ provided 87–95 percent control of velvetleaf (Table 1). Boundary and Tripzin provided 82 and 73 percent control, respectively, and Enlite, Authority First DF, and Rowel FX each provided 78 percent velvetleaf control. BroadAxe XC provided only 27 percent velvetleaf control (Table 1).

None of the PRE treatments provided acceptable ivyleaf morningglory control (Table 1). However, many treatments provided at least 90 percent control when observed 28 days after the POST applications (Table 2).

Woolly cupgrass and velvetleaf control was excellent for all treatments (96–99 percent) following the POST applications (Table 2).

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Dr. Mike Owen, Extension weed specialist and project leader of the Weed Science Research and Demonstration Program since

1984, retired in 2018. We thank Dr. Owen for 35 years of guidance and faithful service to Iowa growers and the crop protection industry.

Dr. Prashant Jha, Montana State University, will succeed Dr. Owen as the new Extension weed specialist and will continue the leadership role for the Weed Science Research and Demonstration Program. We look forward to continuing this work with Dr. Jha in 2019 and beyond.

Additional research results from numerous sites from 2018 and previous years can be downloaded here:

<https://store.extension.iastate.edu/Topic/Crops/Weeds-and-Weed-Control?S=0&A=0&F=0>

Table 1. Two-pass herbicide programs for weed control in soybean, 2018 (June data).

Treatment	Rate	Appln timing	Injury Jun 13 - (%) -	Erbvi ^f Jun 13	Abuth Jun 13	Ipohe Jun 13
	product/acre			(% weed control)		
Untreated	-	-	0	0	0	0
Zidua PRO (Flexstar GT 3.5 + AMS ^a + Outlook + MSO ^b)	6.0 fl oz + (2.0 qt + 8.5 lb/100 gal + 10.0 fl oz + 0.5 % v/v ^c)	PRE + (POST)	2	80	87	40
Zidua SC + Sharpen + (Roundup PowerMAX + AMS)	4.9 fl oz + 1.0 fl oz + (32.0 fl oz + 8.5 lb/100 gal)	PRE + (POST)	5	90	90	38
Surveil + (Abundit Edge + EverpreX + AMS)	4.2 oz wt + (22.0 fl oz + 1.0 pt + 2.0 lb)	PRE + (POST)	15	80	90	50
Enlite + (Abundit Edge + EverpreX + AMS)	3.5 oz wt + (22.0 fl oz + 1.0 pt + 2.0 lb)	PRE + (POST)	2	40	78	45
Authority First DF + (Anthem Maxx + Roundup PowerMAX + AMS)	6.4 oz wt + (2.5 fl oz + 32 fl oz + 8.5 lb/100 gal)	PRE + (POST)	0	40	78	48
Rowel FX + (Warrant Ultra + Roundup PowerMAX + AMS)	3.0 oz wt + (50.0 fl oz + 32.0 fl oz + 8.5 lb/100 gal)	PRE + (POST)	3	45	78	43
Panther Pro + (Cobra + COC ^d + Credit Xtreme + AMS)	15.0 fl oz + (10.0 fl oz + 1.0 pt + 32.0 fl oz + 8.5 lb/100 gal)	PRE + (POST)	12	80	92	52
BroadAxe XC + (Flexstar GT 3.5 + Dual II Magnum + AMS + MSO)	25.0 fl oz + (3.5 pt + 1.0 pt + 8.5 lb/100gal + 1.0 % v/v)	PRE + (POST)	3	87	27	35
Boundary + (Flexstar GT 3.5 + Dual Magnum + AMS + MSO)	2.0 pt + (3.5 pt + 1.0 pt + 8.5 lb/100 gal + 1.0% v/v)	PRE + (POST)	5	95	82	12
Tripzin ZC + (Storm + Roundup PowerMAX + N-Pak AMS Liquid ^e)	42.0 fl oz + (24.0 fl oz + 32.0 fl oz + 6.0 pt)	PRE + (POST)	3	92	73	27
Fierce MTZ SC + (Roundup PowerMAX + AMS + Cobra + COC)	1.0 pt + (32.0 fl oz + 2.5 lbs + 12.0 fl oz + 1.0 pt)	PRE + (POST)	8	92	95	62
LSD (P = 0.05)			4	14	11	10

^aAMS = ammonium sulfate (sprayable fertilizer).^bMSO = Succeed Ultra modified vegetable oil.^cv/v = Volume of product per volume tank mix.^dCOC = Premium crop oil concentrate.^eN-Pak AMS liquid = ammonium sulfate.^fErbvi = woolly cupgrass, Abuth = velvetleaf, Amata = common waterhemp, Ipohe = ivyleaf morningglory.

Table 2. Two-pass herbicide programs for weed control in soybean, 2018 (June and July data).

Treatment	Rate	Appln timing	Injury Jun 21	Erbvi ^f Jul 11	Abuth Jul 11	Ipohe Jul 11
	product/acre			- (%) -	(% weed control)	
Untreated	-	-	0	0	0	0
Zidua PRO (Flexstar GT 3.5 + AMS ^a + Outlook + MSO ^b)	6.0 fl oz + (2.0 qt + 8.5 lb/100 gal + 10.0 fl oz + 0.5 % v/v ^c)	PRE + (POST)	33	96	99	90
Zidua SC + Sharpen + (Roundup PowerMAX + AMS)	4.9 fl oz + 1.0 fl oz + (32.0 fl oz + 8.5 lb/100 gal)	PRE + (POST)	3	99	98	90
Surveil + (Abundit Edge + EverpreX + AMS)	4.2 oz wt + (22.0 fl oz + 1.0 pt + 2.0 lb)	PRE + (POST)	35	99	99	91
Enlite + (Abundit Edge + EverpreX + AMS)	3.5 oz wt + (22.0 fl oz + 1.0 pt + 2.0 lb)	PRE + (POST)	15	99	99	90
Authority First DF + (Anthem Maxx + Roundup PowerMAX + AMS)	6.4 oz wt + (2.5 fl oz + 32 fl oz + 8.5 lb/100 gal)	PRE + (POST)	20	99	99	93
Rowel FX + (Warrant Ultra + Roundup PowerMAX + AMS)	3.0 oz wt + (50.0 fl oz + 32.0 fl oz + 8.5 lb/100 gal)	PRE + (POST)	20	99	96	75
Panther Pro + (Cobra + COC ^d + Credit Xtreme + AMS)	15.0 fl oz + (10.0 fl oz + 1.0 pt + 32.0 fl oz + 8.5 lb/100 gal)	PRE + (POST)	40	98	96	83
BroadAxe XC + (Flexstar GT 3.5 + Dual II Magnum + AMS + MSO)	25.0 fl oz + (3.5 pt + 1.0 pt + 8.5 lb/100 gal + 1.0 % v/v)	PRE + (POST)	30	96	96	87
Boundary + (Flexstar GT 3.5 + Dual Magnum + AMS + MSO)	2.0 pt + (3.5 pt + 1.0 pt + 8.5 lb/100 gal + 1.0% v/v)	PRE + (POST)	35	99	96	72
Tripzin ZC + (Storm + Roundup PowerMAX + N-Pak AMS Liquid ^e)	42.0 fl oz + (24.0 fl oz + 32.0 fl oz + 6.0 pt)	PRE + (POST)	25	98	99	80
Fierce MTZ SC + (Roundup PowerMAX + AMS + Cobra + COC)	1.0 pt + (32.0 fl oz + 2.5 lbs + 12.0 fl oz + 1.0 pt)	PRE + (POST)	40	96	98	82
LSD (P = 0.05)			3	3	4	16

^aAMS = ammonium sulfate (sprayable fertilizer).^bMSO = Succeed Ultra modified vegetable oil.^cv/v = Volume of product per volume tank mix.^dCOC = Premium Crop oil concentrate.^eN-Pak AMS liquid = ammonium sulfate.^fErbvi = woolly cupgrass, Abuth = velvetleaf, Amata = common waterhemp, Ipohe = ivyleaf morningglory.